"QUIZ" for Lecture 9

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E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q9FirstLast.pdf) ASAP BUT NO LATER THAN Oct. 5, 8:00pm

1. Find $\frac{\partial f}{\partial r}$ and $\frac{\partial f}{\partial s}$ as **functions of** r **and** s , if

$$f(x,y) = x^2 + 2xy^2 + 2y^3 \quad ,$$

and the variables are related by $x = r + 2s$ and $y = 3r + 2s$. You do not need to simplify!

$f(x,y) = (r+2s)^2 + 2(r+2s)(3r+2s)^2 + 2(3r+2s)^3$

$\frac{\partial f}{\partial r} = 2(r+2s) + 2(r+2s)(2)(3)(3r+2s) + 2(3r+2s)^2 + 6(3r+2s)^2(3)$

$\frac{\partial f}{\partial s} = 2(r+2s)(2) + 2(r+2s)(2)(3r+2s)(2) + 2(3r+2s)^2(2) + 2(3)(3r+2s)^2(2)$

2. Find $\frac{\partial z}{\partial x}$ and $\frac{\partial z}{\partial y}$ if

$$x^2 + y^2 + z^2 = 5xyz + 1 \quad .$$

$F(x,y,z) = x^2 + y^2 + z^2 - 5xyz - 1 = 0$

$F_x(x,y,z) = 2x - 5yz$

$F_y(x,y,z) = 2y - 5xz$

$F_z = 2z - 5xy$

$\frac{\partial z}{\partial x} = \frac{2z - 5xy}{2x - 5yz}$

$\frac{\partial z}{\partial y} = \frac{2z - 5xy}{2y - 5xz}$